

DATE: October 9, 1998

SUBJECT: Results for Water Supply Performance
Evaluation Study 41 (WS041)

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TO: Designated USEPA and State WS Study Coordinators,
and Selected Individual Laboratory Addressees

THRU: Raymond J. Wesselman, Chief
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I. DISCUSSION OF WS041 CHEMISTRY RESULTS

WS041 has been completed by the National Exposure Research Laboratory - Cincinnati (NERL-Cincinnati) as the last FY98 study for evaluation of U.S. Environmental Protection Agency (USEPA) regional laboratories, the state laboratories and other selected laboratories involved in chemical analyses covered under the Drinking Water Laboratory Certification Program. WS041 is also the last WS study to be conducted directly by the USEPA. As seen in the enclosed summaries, the majority of laboratories produced acceptable results from these samples; 88.3 percent of the usable results reported were acceptable. The results relating to your interests are also enclosed.

One analyte had a failure rate over 30 percent and five analytes were not evaluated:

- 1) The failure rate for 2,4-D was 32.5 percent of those reporting it; almost all of these unacceptable data were below the study limits. Of the 73.1 $\mu\text{g/L}$ of 2,4-D present, 54.8 $\mu\text{g/L}$ was as a butyl ester, which will not register as 2,4-D unless the laboratory hydrolyzes it initially and follows all the steps outlined in the procedure for method 515.1 or 515.2, as they are supposed to. A complete failure to hydrolyze was

apparently not a common problem, because there were very few results at or below 18 $\mu\text{g/L}$. Past experience also shows that laboratories following an approved method characteristically produce 2,4-D data with a low bias, which was estimated at 77 percent of the true value for this study. This low bias probably comes from a disconcertingly large number of values resulting from incomplete and inadequate hydrolyzation, derivatization and/or methylation before measurement of the 2,4-D. These two influences, both tending to cause low recovery, probably caused a majority of the data reported below the fixed study limits of 100 percent \pm 50 percent of the true value.

- 2) The four low-level turbidity analytes were NOT EVALUATED for this study. These data were collected for information purposes and were never intended to be evaluated as a part of WS041. A separate memorandum summarizing the low-level turbidity data has been enclosed for your information and possible distribution.
- 3) The other analyte NOT EVALUATED was lead. During preparation, although no records show it, some amount of sulfate was apparently added to the trace metals concentrate, causing the barium and some of the lead to precipitate inside the ampuls. Lead data from the study were unusually variable, probably because the precipitate was sometimes included in the sample analyzed and other times not included. Since limits are fixed by regulation at 70 percent to 130 percent, the most appropriate action possible was not to evaluate the lead data.

Within the data reported for VOC #2, the only qualitative-challenge group in this study, the missing analyte with the highest false positive rates was chloroform at about 2.5 percent of those reporting data for VOC #2.

This memorandum highlights the analytes that had a high rate of "NOT ACCEPT." analytical responses. It is each laboratory management's responsibility to investigate their "NOT ACCEPT." results to discover their own specific problems.

For those interested in the aroclor present in the PCB sample, it was 1242.

II. GENERAL INFORMATION

In response to 40 CFR Part 141 modifications, the following acceptance limits were used at all concentration levels unless otherwise specified:

<u>Analyte</u>	<u>Acceptance Limits</u>
Antimony	True Value (TV) \pm 30%, for TV \geq 6 $\mu\text{g/L}$
Barium	TV \pm 15%, for TV \geq 150 $\mu\text{g/L}$
Beryllium	TV \pm 15%, for TV \geq 1 $\mu\text{g/L}$
Cadmium	TV \pm 20%, for TV \geq 2 $\mu\text{g/L}$
Chromium	TV \pm 15%, for TV \geq 10 $\mu\text{g/L}$
Copper	TV \pm 10%, for TV \geq 50 $\mu\text{g/L}$
Lead	TV \pm 30%, for TV \geq 5 $\mu\text{g/L}$
Mercury	TV \pm 30%, for TV \geq 0.5 $\mu\text{g/L}$
Nickel	TV \pm 15%, for TV \geq 10 $\mu\text{g/L}$
Selenium	TV \pm 20%, for TV \geq 10 $\mu\text{g/L}$
Thallium	TV \pm 30%, for TV \geq 2 $\mu\text{g/L}$

<u>Analyte</u>	<u>Acceptance Limits</u>
Nitrate	TV \pm 10%, for TV \geq 0.4 mg/L
Nitrite	TV \pm 15%, for TV \geq 0.4 mg/L
Fluoride	TV \pm 10%, for TV between 1 and 10 mg/L
Total Cyanide	TV \pm 25%, for TV \geq 0.1 mg/L
Alachlor	TV \pm 45%
Atrazine	TV \pm 45%
Chlordane	TV \pm 45%

<u>Analyte</u>	<u>Acceptance Limits</u>
Endrin	TV \pm 30%
Heptachlor	TV \pm 45%
Heptachlor epoxide	TV \pm 45%
Lindane	TV \pm 45%
Methoxychlor	TV \pm 45%
Toxaphene	TV \pm 45%
Carbofuran	TV \pm 45%

<u>Analyte</u>	<u>Acceptance Limits</u>
2,4-D	True Value (TV) \pm 50%
2,4,5-TP (Silvex)	TV \pm 50%
Pentachlorophenol	TV \pm 50%
Decachlorobiphenyl	TV \pm 100%
THMs	TV \pm 20%
DBCP	TV \pm 40%
EDB	TV \pm 40%
Vinyl chloride	TV \pm 40%
all other regulated VOCs:	TV \pm 40%, for TV <10 μ g/L
	TV \pm 20%, for TV \geq 10 μ g/L

(Benzene, Carbon Tetrachloride, Chlorobenzene, 1,2-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichloroethane, 1,1-Dichloroethylene, Cis-1,2-Dichloroethylene, Trans-1,2-Dichloroethylene, Dichloromethane, 1,2-Dichloropropane, Ethylbenzene, Styrene, Tetrachloroethylene, Toluene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichloroethylene, 1,2,4-Trichlorobenzene, and Total Xylenes)

For all other analytes and/or concentrations: A statistical 95% prediction interval was used based on the statistics of analytical results from USEPA and state laboratories.

The report for each participating Office of Research and Development (ORD) laboratory is sent to the Laboratory Director. Reports for participating contract/grant laboratories are sent to the responsible QA Officer. Regional and state coordinators will find enclosed a personal computer disk containing the study files of interest to them, one copy of the report for each of their participating laboratories and their part of the study participant list. The addressees are responsible for any additional distribution of study results that may be necessary to properly inform state agencies and other participants.

Regarding the procedure that we have established for formal correction of data entry errors, laboratories are responsible for reporting any data entry errors in their report. These errors must to be reported as soon as possible, however, we will accept errors reported up to four (4) months from the date on the cover memorandum used by us for the distribution of individual laboratory reports at the conclusion of the study. If confirmed in our records, errors received before the four-month deadline will be corrected in our study file and report pages will be corrected and reissued to the laboratory and the coordinators that nominated that laboratory. After the four months, PC disks containing the corrected study results will be distributed to each coordinator.

For each laboratory, the Participant List shows all the coordinators that requested that laboratory's participation and identifies the coordinator with primary responsibility for informing the laboratory. If your region/state is the only requesting office, or if your region/state is listed after "samples thru" in the Participant List, it is your responsibility to provide that laboratory with a copy of their evaluation report. Every coordinator is responsible for seeing that any laboratory they requested receives any study summaries, true values, acceptance limits, etc., that the laboratory may request. Requestors for such study information reaching NERL-Cincinnati or ManTech, will be instructed to contact their study coordinator(s) for this information.

In addition, each Regional Coordinator is responsible for assuring that each of their states receives all appropriate study information.

For each "NOT ACCEPT." performance evaluation received, the laboratory should determine the cause(s) and make the procedural changes necessary to improve future data quality.

Thank you for your continued cooperation in these studies. If you have any questions about or problems with the study or the reports, please do not hesitate to contact me at (513) 569-7216.